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Homework 1: RAW Processing

RAW DNG Image 

This lab focuses on implementing a basic pipeline to convert the raw sensor output of a camera into a processed JPEG image.

Code Explanation

To begin, the 16-bit integer array from the RAW DNG file is read in as a rawpy array so that operations can be performed on the RAW image. This array is normalized and turned into a 32-bit floating value between 0 and 1.

Since the camera sensor used a Bayer camera filter, 3x3 kernel arrays can be made for each color channel (red, green, and blue) to interpolate missing color information through a process called demosaicing. These kernels average the values from surrounding pixels of the same color to fill in the gaps in the color pattern.

After demosaicing, the image is white balanced by scaling each color channel so that its mean is 0.25

Then, an inverse gamma curve is applied to the image array by raising each pixel value to the power of 0.55.

The image is finally scaled by 255, converted to an 8-bit unsigned integer, and saved as a jpeg file using `imageio.imwrite`.